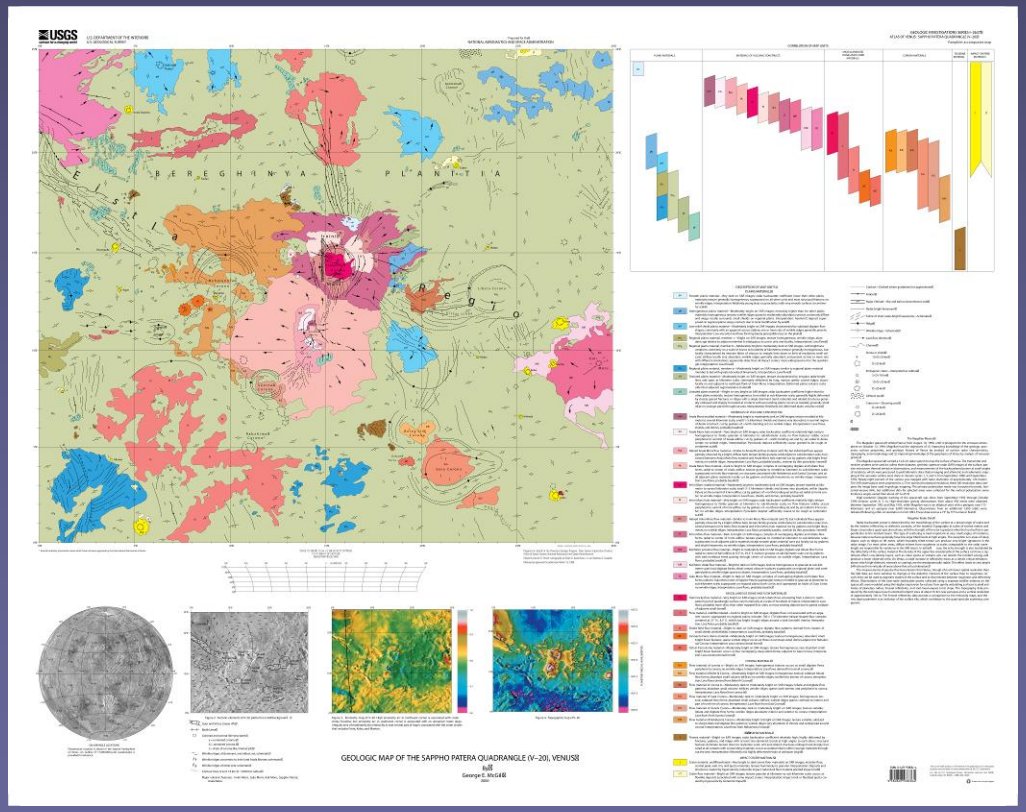
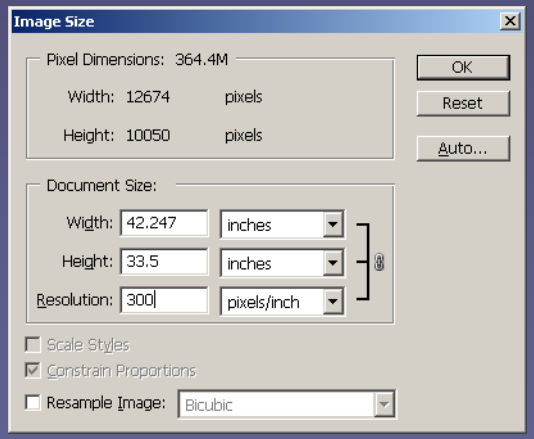
Geologic Map Conversion

Convert Geologic Maps from Illustrator format to an ArcGIS Geodatabase

Photoshop

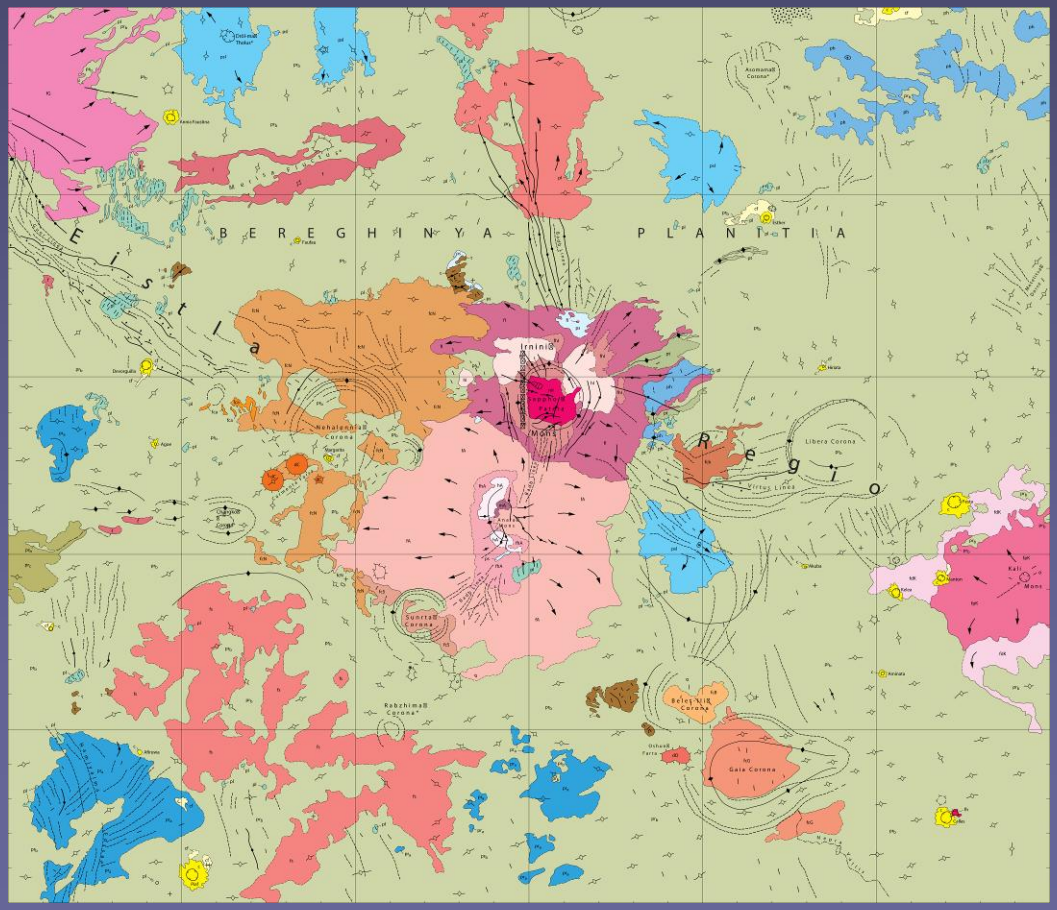
- Open *.ai map file in Photoshop, turn off anti alias if it crashes.
- Set image size to 300 dpi, flatten image.
- Save out to *.Png





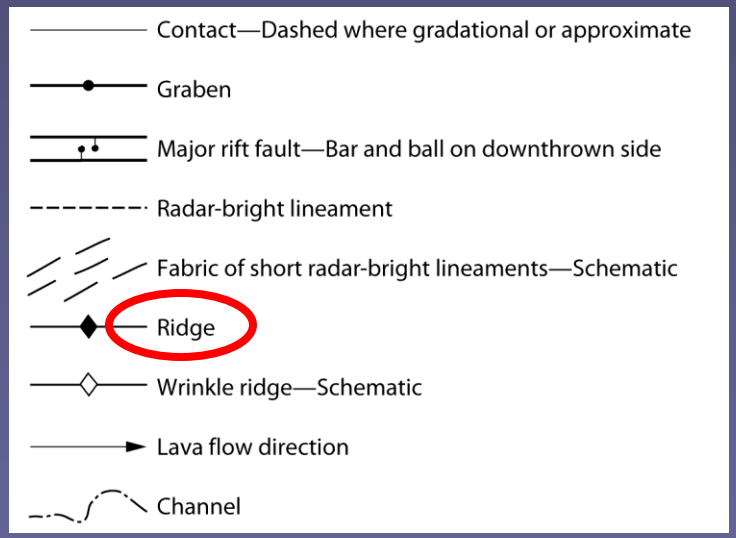
Photoshop

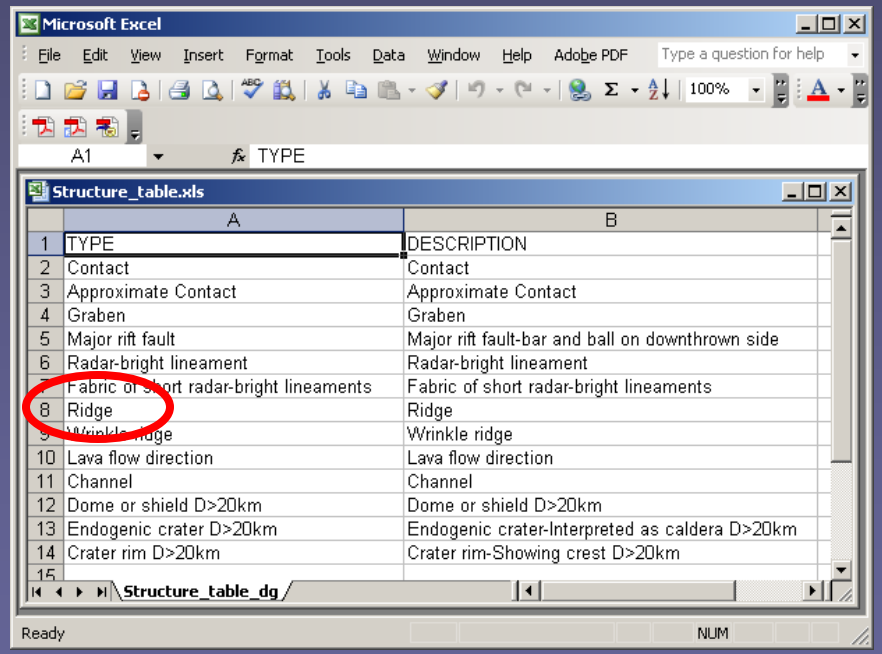
- Clip out map area, keeping outside edge of grid. Save file as a new Tiff image.



Copy/Paste Structure Attributes from Illustrator file into Excel

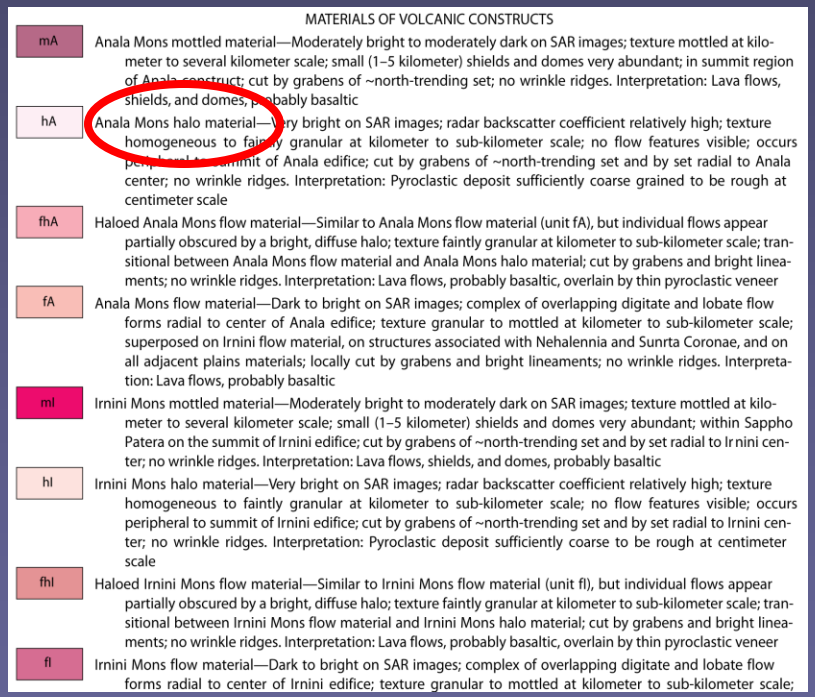
Later you will use ‘Table to Domain’ in ArcMap





	A	B
1	TYPE	DESCRIPTION
2	Contact	Contact
3	Approximate Contact	Approximate Contact
4	Graben	Graben
5	Major rift fault	Major rift fault-bar and ball on downthrown side
6	Radar-bright lineament	Radar-bright lineament
7	Fabric of short radar-bright lineaments	Fabric of short radar-bright lineaments
8	Ridge	Ridge
9	Wrinkle ridge	Wrinkle ridge
10	Lava flow direction	Lava flow direction
11	Channel	Channel
12	Dome or shield D>20km	Dome or shield D>20km
13	Endogenic crater D>20km	Endogenic crater-Interpreted as caldera D>20km
14	Crater rim D>20km	Crater rim-Showing crest D>20km
15		

Copy/Paste Geo Unit Attributes from Illustrator file into Excel



MATERIALS OF VOLCANIC CONSTRUCTS

mA — Anala Mons mottled material—Moderately bright to moderately dark on SAR images; texture mottled at kilometer to several kilometer scale; small (1–5 kilometer) shields and domes very abundant; in summit region of Anala construct; cut by grabens of ~north-trending set; no wrinkle ridges. Interpretation: Lava flows, shields, and domes, probably basaltic

hA — Anala Mons halo material—Very bright on SAR images; radar backscatter coefficient relatively high; texture homogeneous to faintly granular at kilometer to sub-kilometer scale; no flow features visible; occurs peripheral to summit of Anala edifice; cut by grabens of ~north-trending set and by set radial to Anala center; no wrinkle ridges. Interpretation: Pyroclastic deposit sufficiently coarse grained to be rough at centimeter scale

fhA — Haloed Anala Mons flow material—Similar to Anala Mons flow material (unit fA), but individual flows appear partially obscured by a bright, diffuse halo; texture faintly granular at kilometer to sub-kilometer scale; transitional between Anala Mons flow material and Anala Mons halo material; cut by grabens and bright lineaments; no wrinkle ridges. Interpretation: Lava flows, probably basaltic, overlain by thin pyroclastic veneer

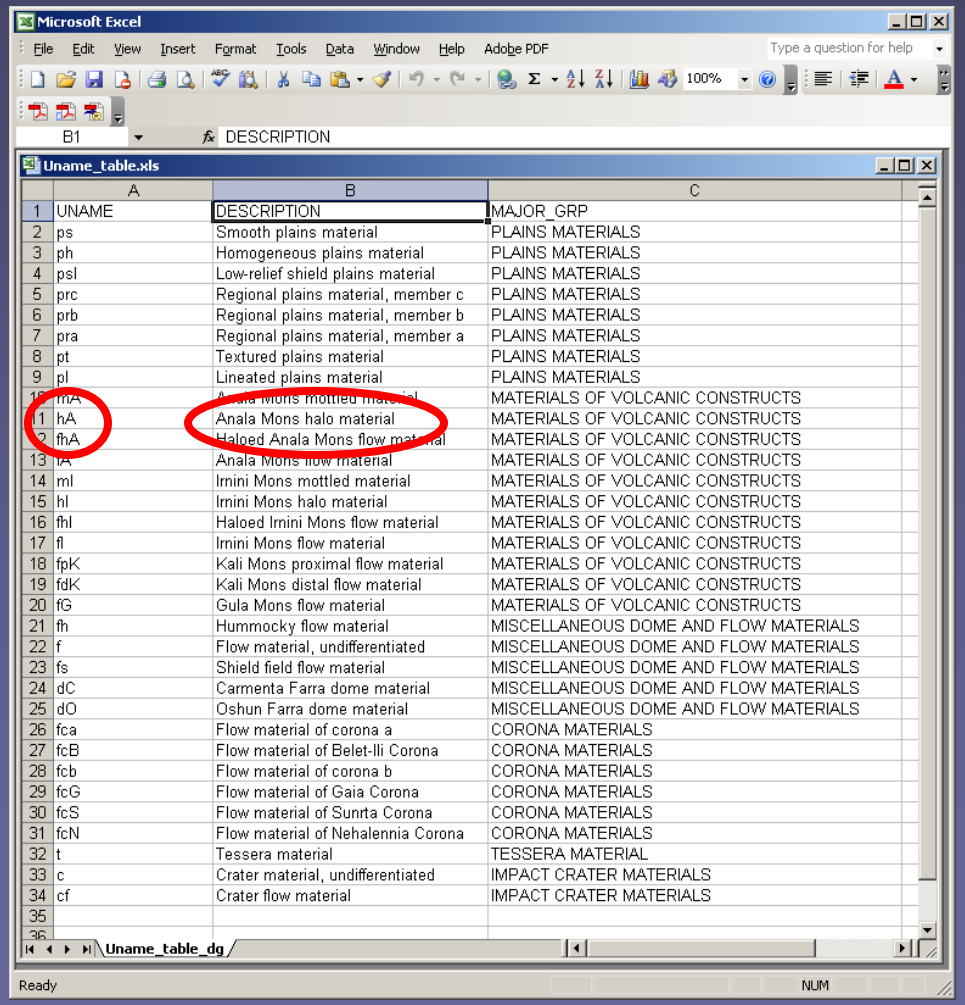
fA — Anala Mons flow material—Dark to bright on SAR images; complex of overlapping digitate and lobate flow forms radial to center of Anala edifice; texture granular to mottled at kilometer to sub-kilometer scale; superposed on Irnini flow material, on structures associated with Nehalennia and Sunrta Coronae, and on all adjacent plains materials; locally cut by grabens and bright lineaments; no wrinkle ridges. Interpretation: Lava flows, probably basaltic

ml — Irnini Mons mottled material—Moderately bright to moderately dark on SAR images; texture mottled at kilometer to several kilometer scale; small (1–5 kilometer) shields and domes very abundant; within Sappho Patera on the summit of Irnini edifice; cut by grabens of ~north-trending set and by set radial to Irnini center; no wrinkle ridges. Interpretation: Lava flows, shields, and domes, probably basaltic

hl — Irnini Mons halo material—Very bright on SAR images; radar backscatter coefficient relatively high; texture homogeneous to faintly granular at kilometer to sub-kilometer scale; no flow features visible; occurs peripheral to summit of Irnini edifice; cut by grabens of ~north-trending set and by set radial to Irnini center; no wrinkle ridges. Interpretation: Pyroclastic deposit sufficiently coarse to be rough at centimeter scale

fhl — Haloed Irnini Mons flow material—Similar to Irnini Mons flow material (unit fl), but individual flows appear partially obscured by a bright, diffuse halo; texture faintly granular at kilometer to sub-kilometer scale; transitional between Irnini Mons flow material and Irnini Mons halo material; cut by grabens and bright lineaments; no wrinkle ridges. Interpretation: Lava flows, probably basaltic, overlain by thin pyroclastic veneer

fl — Irnini Mons flow material—Dark to bright on SAR images; complex of overlapping digitate and lobate flow forms radial to center of Irnini edifice; texture granular to mottled at kilometer to sub-kilometer scale;



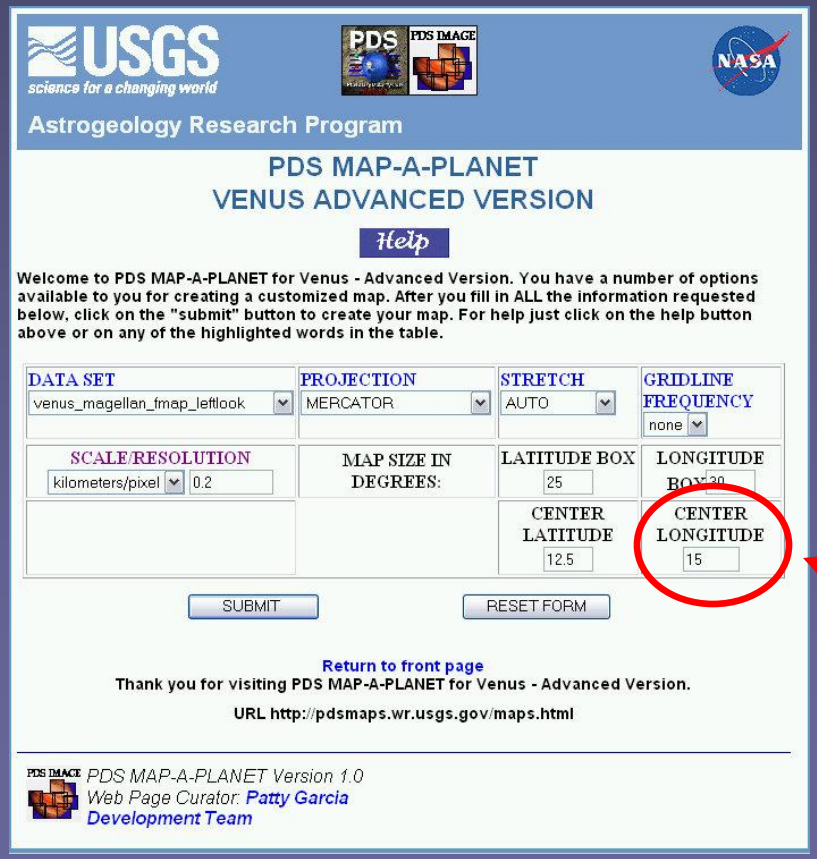
	A	B	C
1	UNAME	DESCRIPTION	MAJOR_GRP
2	ps	Smooth plains material	PLAINS MATERIALS
3	ph	Homogeneous plains material	PLAINS MATERIALS
4	psl	Low-relief shield plains material	PLAINS MATERIALS
5	prc	Regional plains material, member c	PLAINS MATERIALS
6	prb	Regional plains material, member b	PLAINS MATERIALS
7	pra	Regional plains material, member a	PLAINS MATERIALS
8	pt	Textured plains material	PLAINS MATERIALS
9	pl	Lineated plains material	PLAINS MATERIALS
10	mA	Anala Mons mottled material	MATERIALS OF VOLCANIC CONSTRUCTS
11	hA	Anala Mons halo material	MATERIALS OF VOLCANIC CONSTRUCTS
12	fhA	Haloed Anala Mons flow material	MATERIALS OF VOLCANIC CONSTRUCTS
13	fA	Anala Mons flow material	MATERIALS OF VOLCANIC CONSTRUCTS
14	ml	Irnini Mons mottled material	MATERIALS OF VOLCANIC CONSTRUCTS
15	hl	Irnini Mons halo material	MATERIALS OF VOLCANIC CONSTRUCTS
16	fhl	Haloed Irnini Mons flow material	MATERIALS OF VOLCANIC CONSTRUCTS
17	fl	Irnini Mons flow material	MATERIALS OF VOLCANIC CONSTRUCTS
18	fpK	Kali Mons proximal flow material	MATERIALS OF VOLCANIC CONSTRUCTS
19	fdK	Kali Mons distal flow material	MATERIALS OF VOLCANIC CONSTRUCTS
20	fG	Gula Mons flow material	MATERIALS OF VOLCANIC CONSTRUCTS
21	fh	Hummocky flow material	MISCELLANEOUS DOME AND FLOW MATERIALS
22	f	Flow material, undifferentiated	MISCELLANEOUS DOME AND FLOW MATERIALS
23	fs	Shield field flow material	MISCELLANEOUS DOME AND FLOW MATERIALS
24	dC	Carmenta Farra dome material	MISCELLANEOUS DOME AND FLOW MATERIALS
25	dO	Oshun Farra dome material	MISCELLANEOUS DOME AND FLOW MATERIALS
26	fca	Flow material of corona a	CORONA MATERIALS
27	fcB	Flow material of Belet-Ili Corona	CORONA MATERIALS
28	fcb	Flow material of corona b	CORONA MATERIALS
29	fcG	Flow material of Gaia Corona	CORONA MATERIALS
30	fcS	Flow material of Sunrta Corona	CORONA MATERIALS
31	fcN	Flow material of Nehalennia Corona	CORONA MATERIALS
32	t	Tessera material	TESSERA MATERIAL
33	c	Crater material, undifferentiated	IMPACT CRATER MATERIALS
34	cf	Crater flow material	IMPACT CRATER MATERIALS
35			
36			

Convert Map Info into .dbf Tables

- Save Excel file to .dbf format – some attributes may be truncated and will need to be updated in the ArcCatalog Geodatabase Domain.

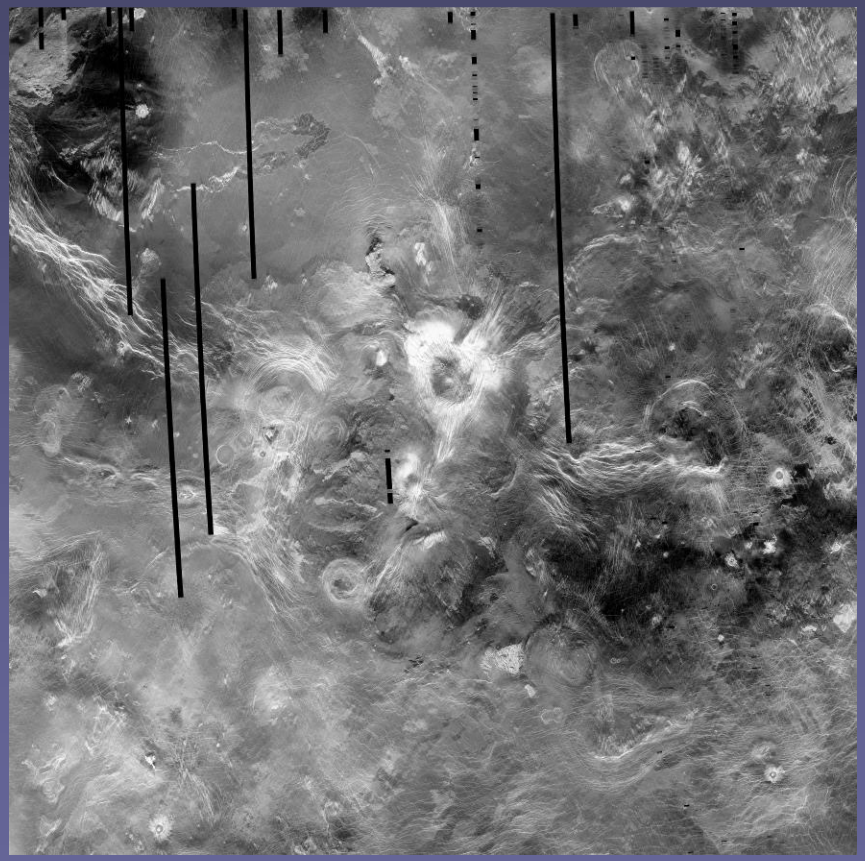
Update Map Image Base

- Order image from MAP-A-PLANET as a Tiff. Try for a 200 MB image size, request a world file.



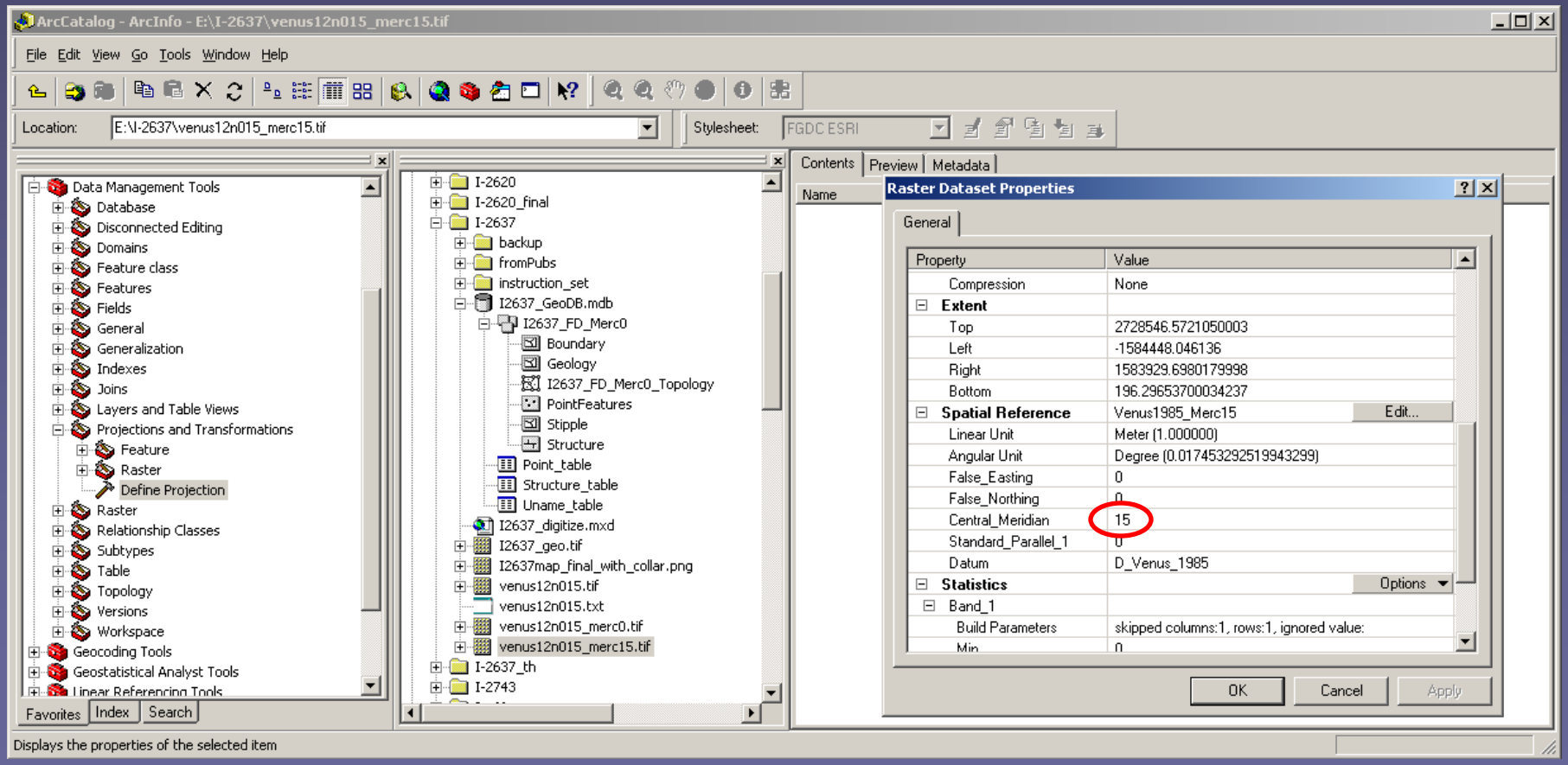
Take note of CLON

Photoshop: Check New Image Base



ArcCatalog: Set the MAP-A-PLANET Image Projection

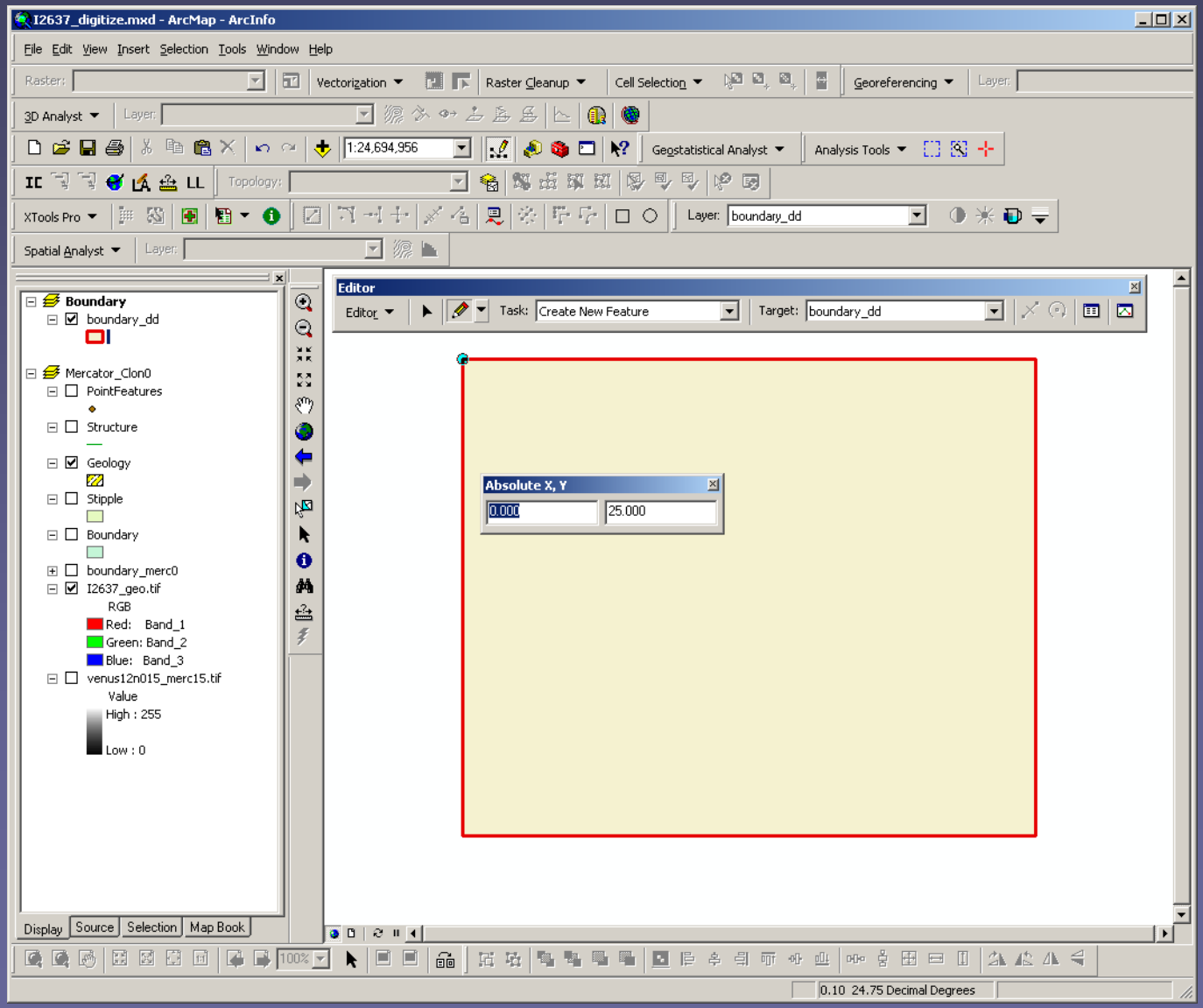
Use to reconcile different CLONs between ArcMap and MAP-A-PLANET when an image translation is needed.



ArcMap

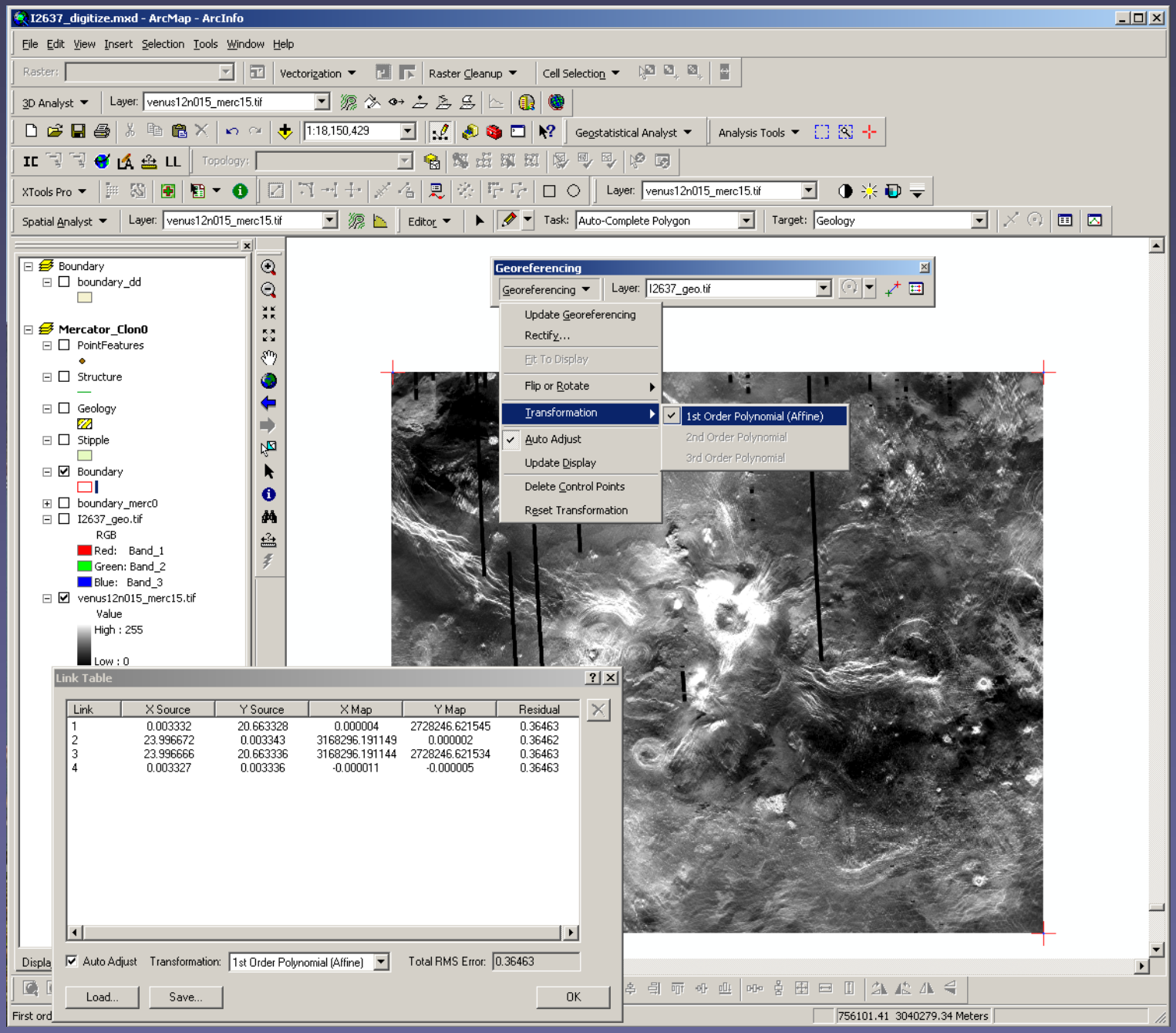
- Open a new project. Set the projection of the ArcMap Data Frame in decimal degrees.
- Create a new polygon shapefile to the exact extents of the existing map boundary.
- Export the boundary shapefile in projected meters.

ArcMap: Create a polygon shapefile in decimal degrees using map extents



Register geologic map image

- Register the clipped out Photoshop Tiff to the projected boundary shapefile – use ArcMap Georeferencing Toolbar.

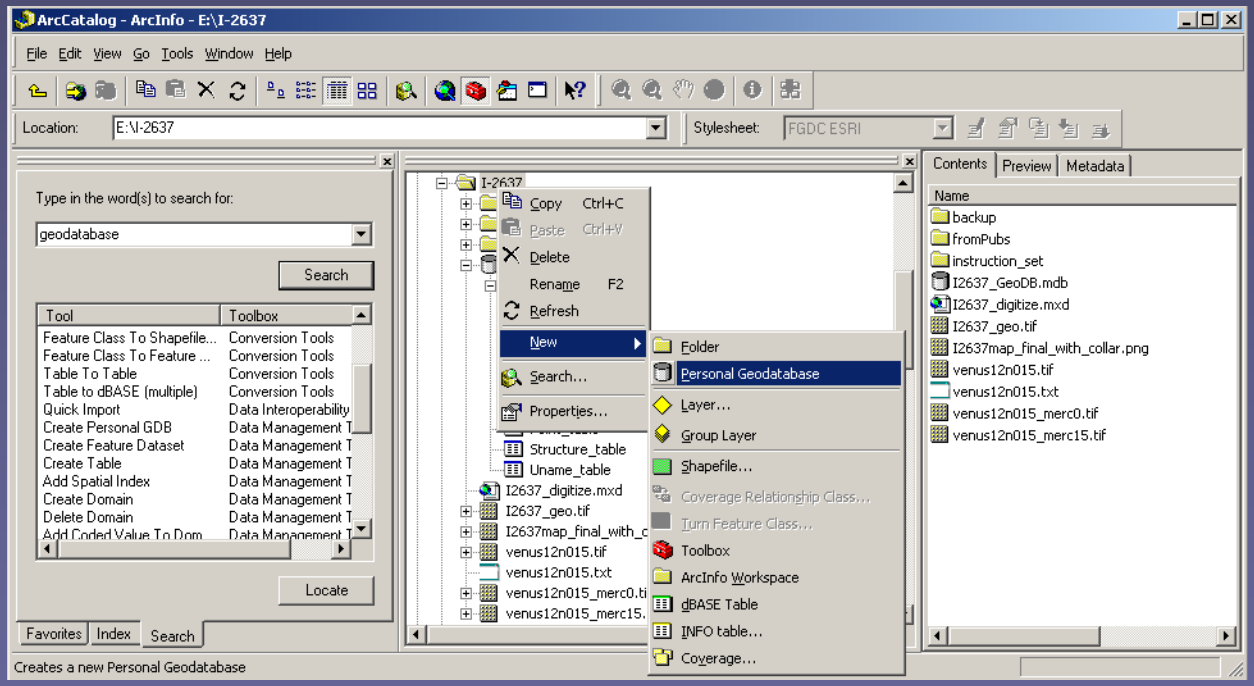

I2637_digitize.mxd - ArcMap - ArcInfo
File Edit View Insert Selection Tools Window Help
Raster: Vectorization Raster Cleanup Cell Selection
3D Analyst Layer: venus12n015_merc15.tif
1:18,150,429 Geostatistical Analyst Analysis Tools
Topology:
XTools Pro Layer: venus12n015_merc15.tif
Spatial Analyst Layer: venus12n015_merc15.tif Editor Task: Auto-Complete Polygon Target: Geology
Boundary
boundary_dd
Mercator_Clon0
PointFeatures
Structure
Geology
Stipple
Boundary
boundary_merc0
I2637_geo.tif
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
venus12n015_merc15.tif
Value
High : 255
Low : 0
Georeferencing
Georeferencing Layer: I2637_geo.tif
Update Georeferencing
Rectify...
Fit To Display
Flip or Rotate
Transformation
Auto Adjust
Update Display
Delete Control Points
Reset Transformation
1st Order Polynomial (Affine)
2nd Order Polynomial
3rd Order Polynomial
Link Table
Link X Source Y Source X Map Y Map Residual
1 0.003332 20.663328 0.000004 2728246.621545 0.36463
2 23.996672 0.003343 3168296.191149 0.000002 0.36462
3 23.996666 20.663336 3168296.191144 2728246.621534 0.36463
4 0.003327 0.003336 -0.000011 -0.000005 0.36463
Auto Adjust Transformation: 1st Order Polynomial (Affine) Total RMS Error: 0.36463
Load... Save... OK
756101.41 3040279.34 Meters

Verify registration of boundary, geologic map, and old map image base using MAP-A-PLANET image

- Check registration of MAP-A-PLANET image against the georeferenced Photoshop map base image in ArcMAP

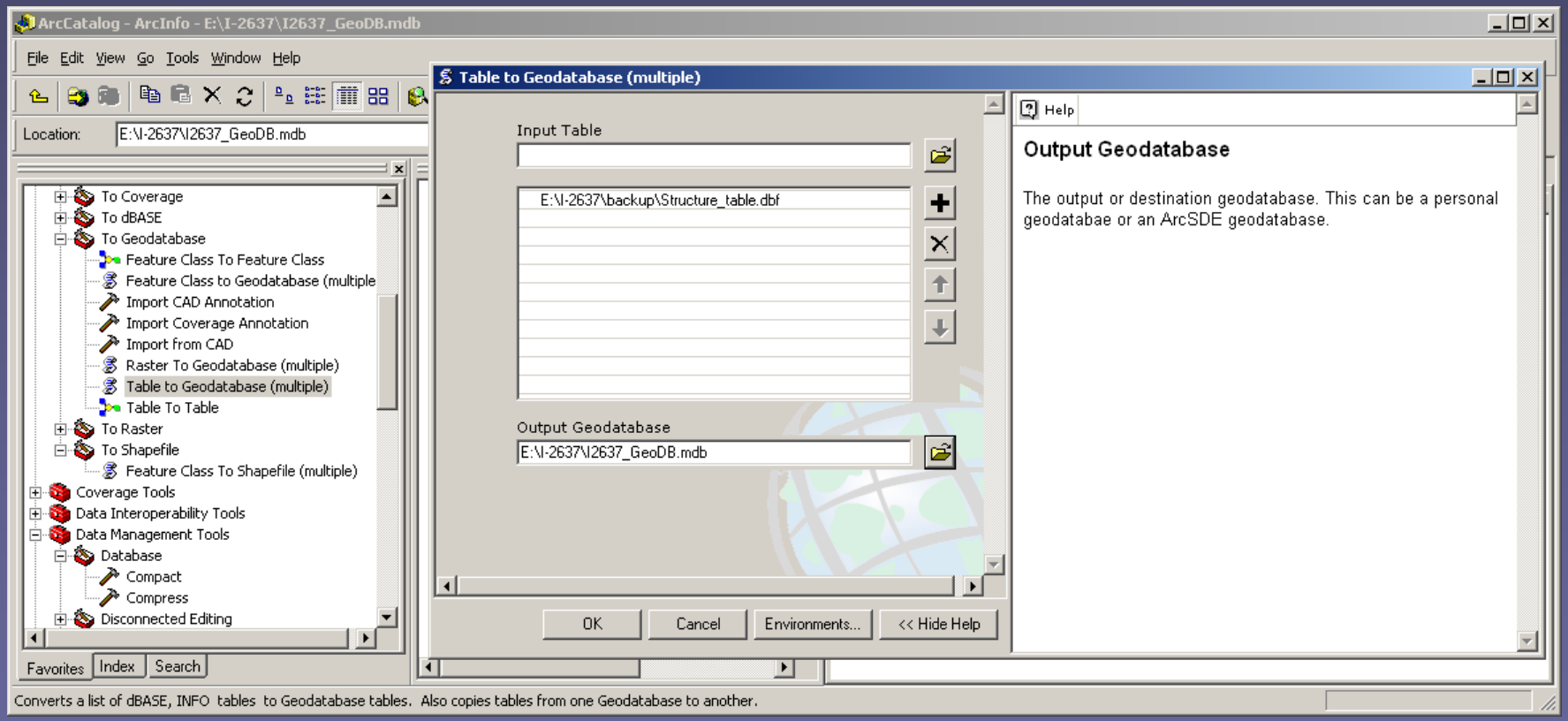
ArcCatalog

- Create a Geodatabase.



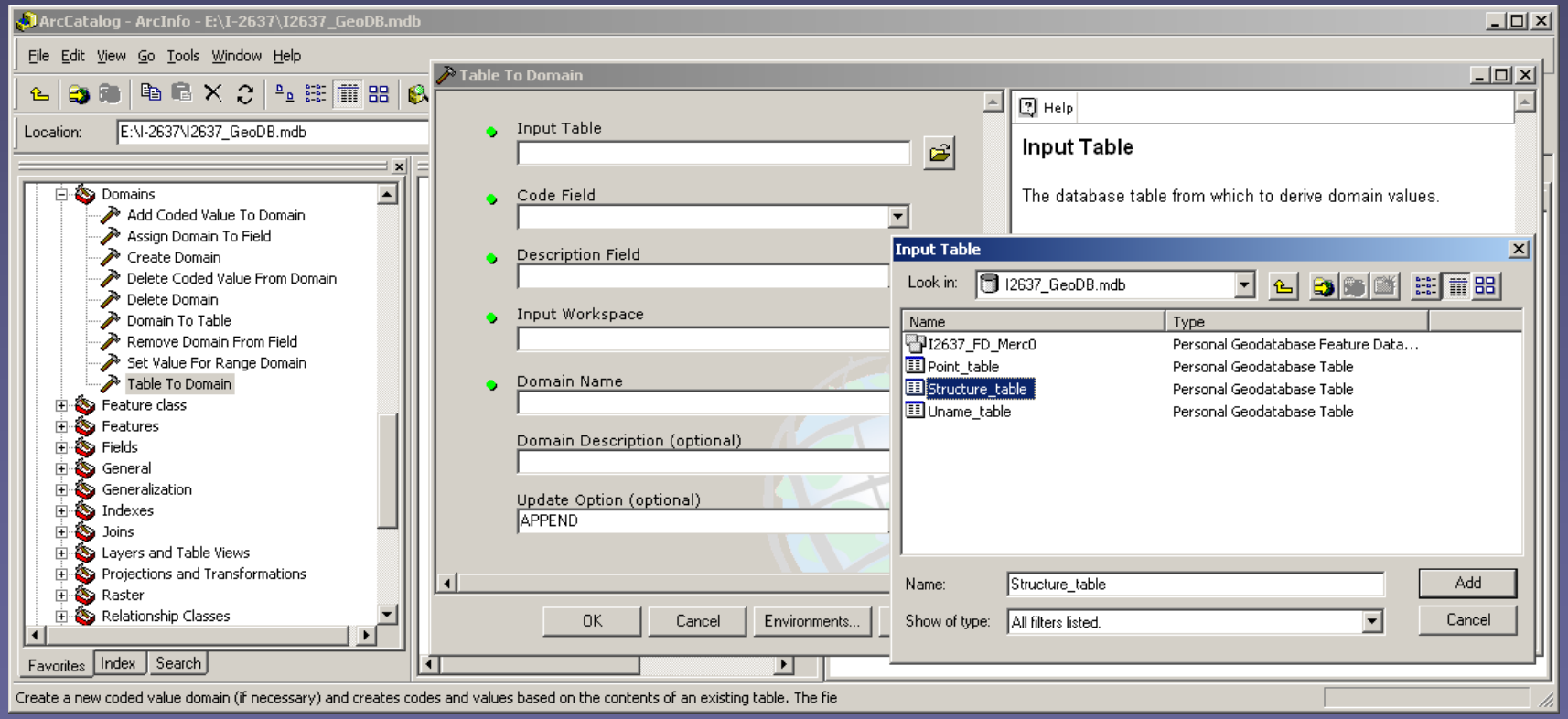
Create Attribute Domains

ArcCatalog: Move *.dbf Tables to Geodatabase



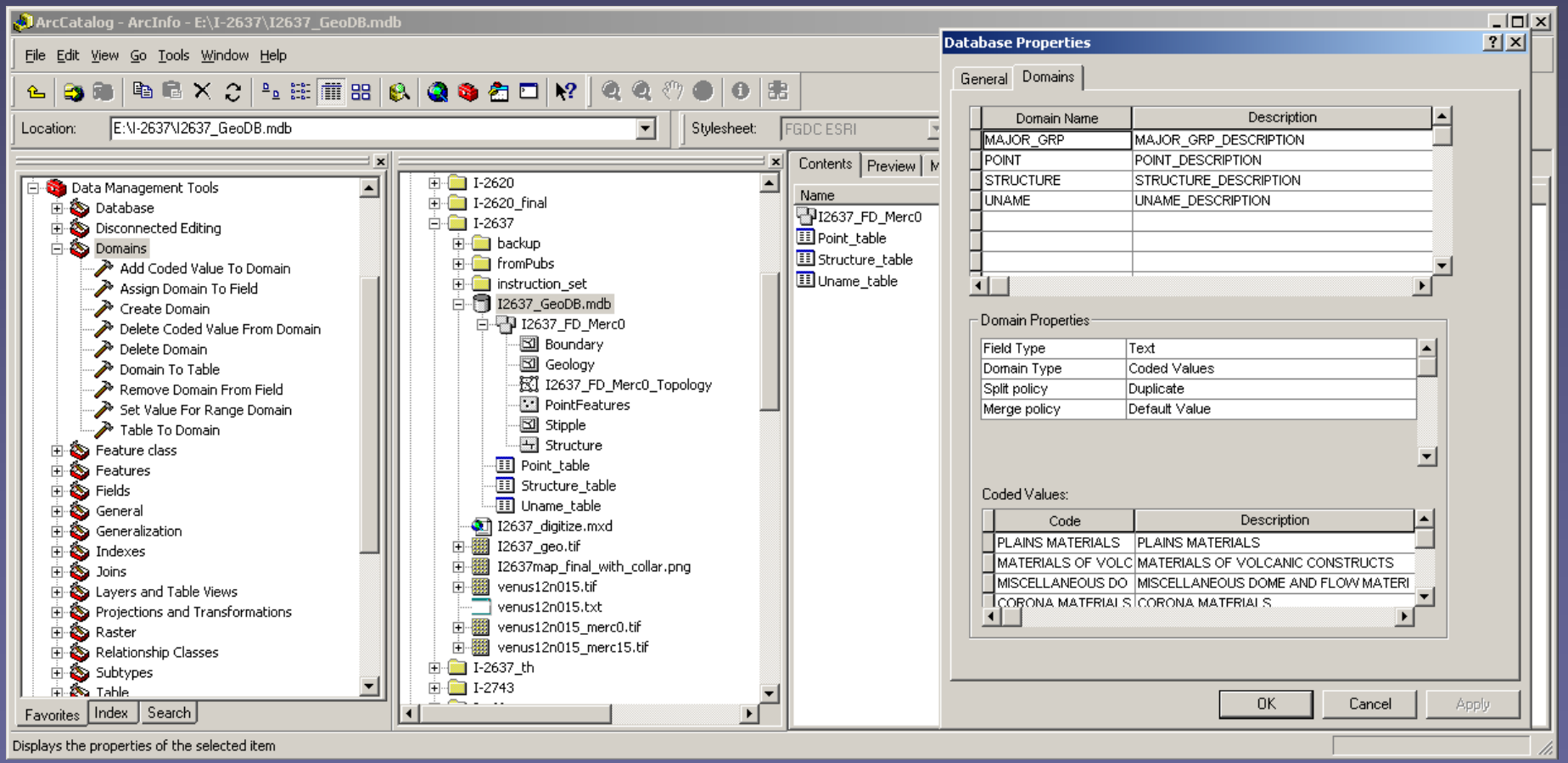
Create Attribute Domains

ArcCatalog: Run Tool – Table to Domain



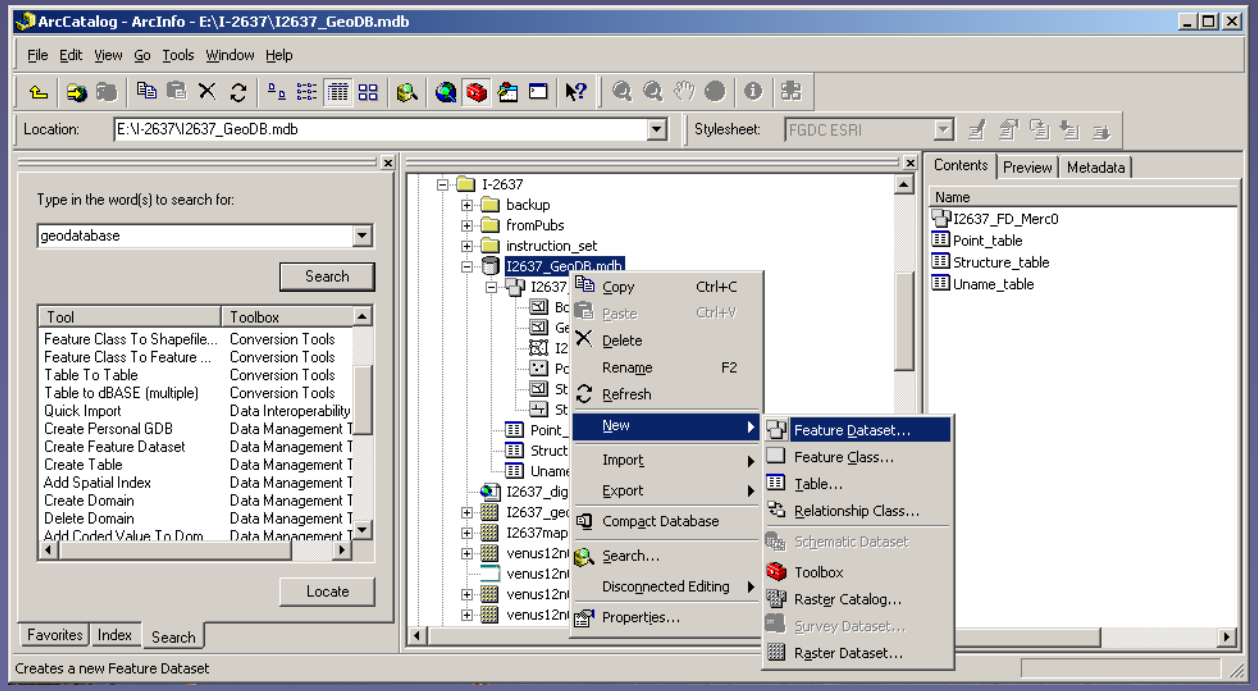
Update Domain Attributes

Check for truncated attributes under ‘Code’ and ‘Description’ –Edit as necessary.



ArcCatalog

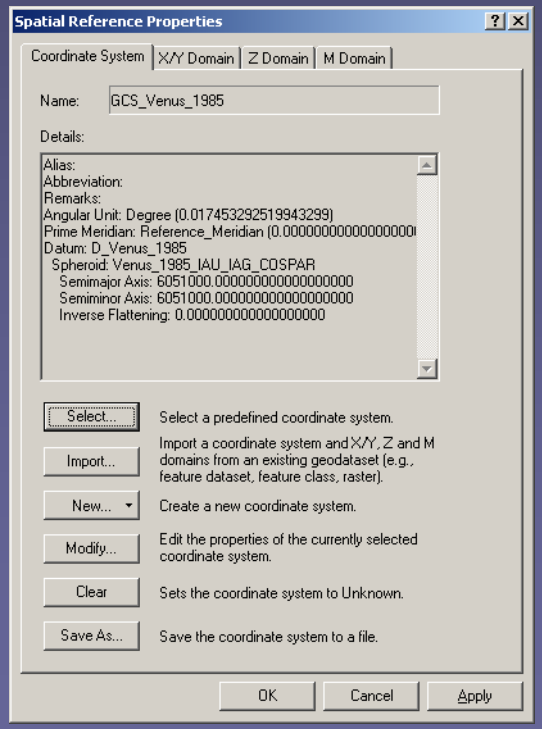
- From within the Geodatabase, Create a Feature Dataset in projected meters. Use the geologic boundary file to import the projection or set it manually.

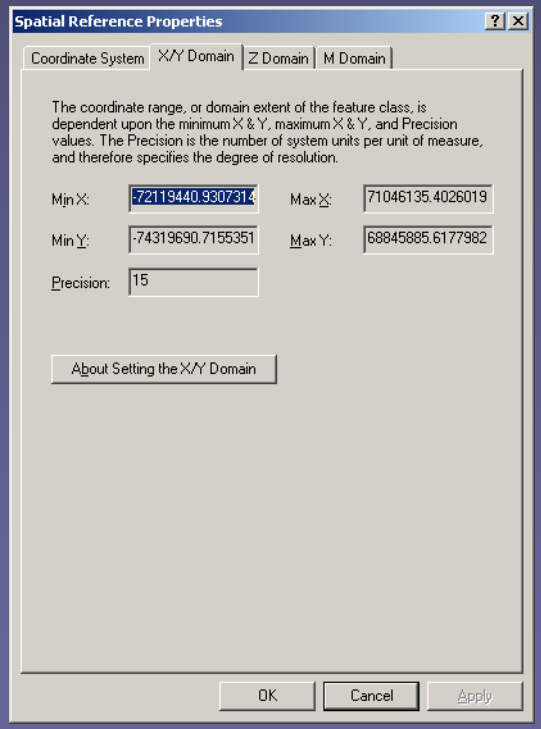


Set Feature Dataset Parameters

Set Coordinate System

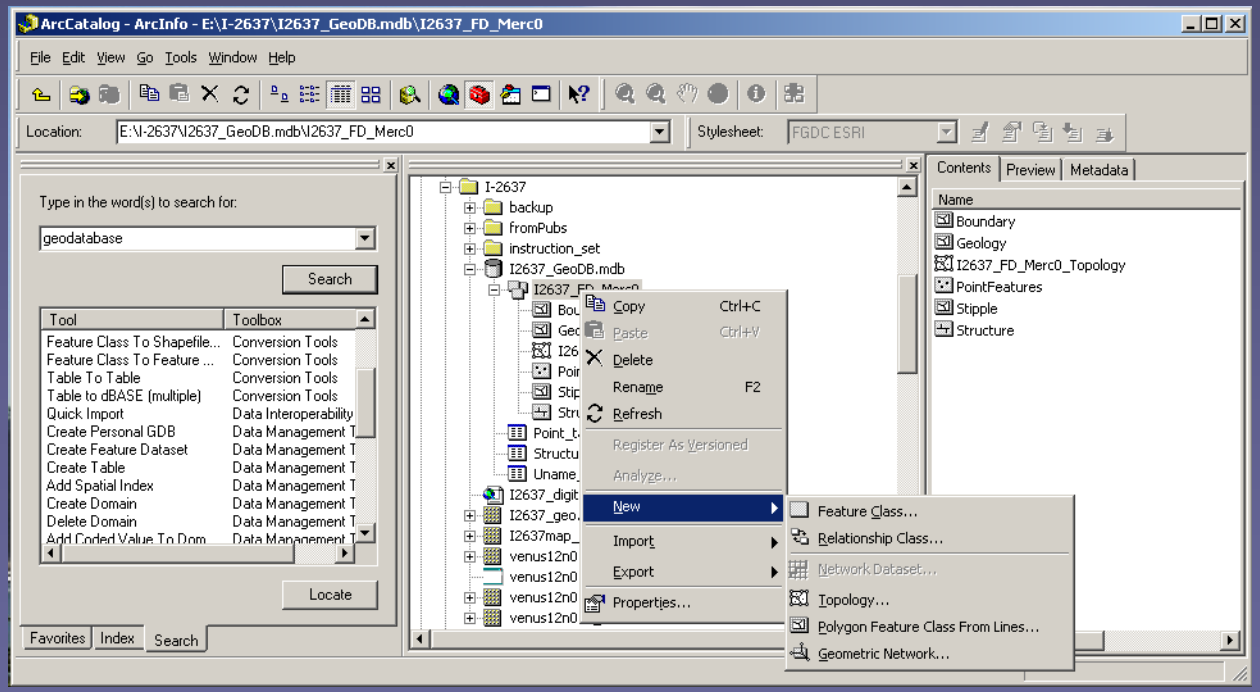
Set X/Y Domain. Use map extents or calculate extents. This example Is based on map extents plus a buffer.



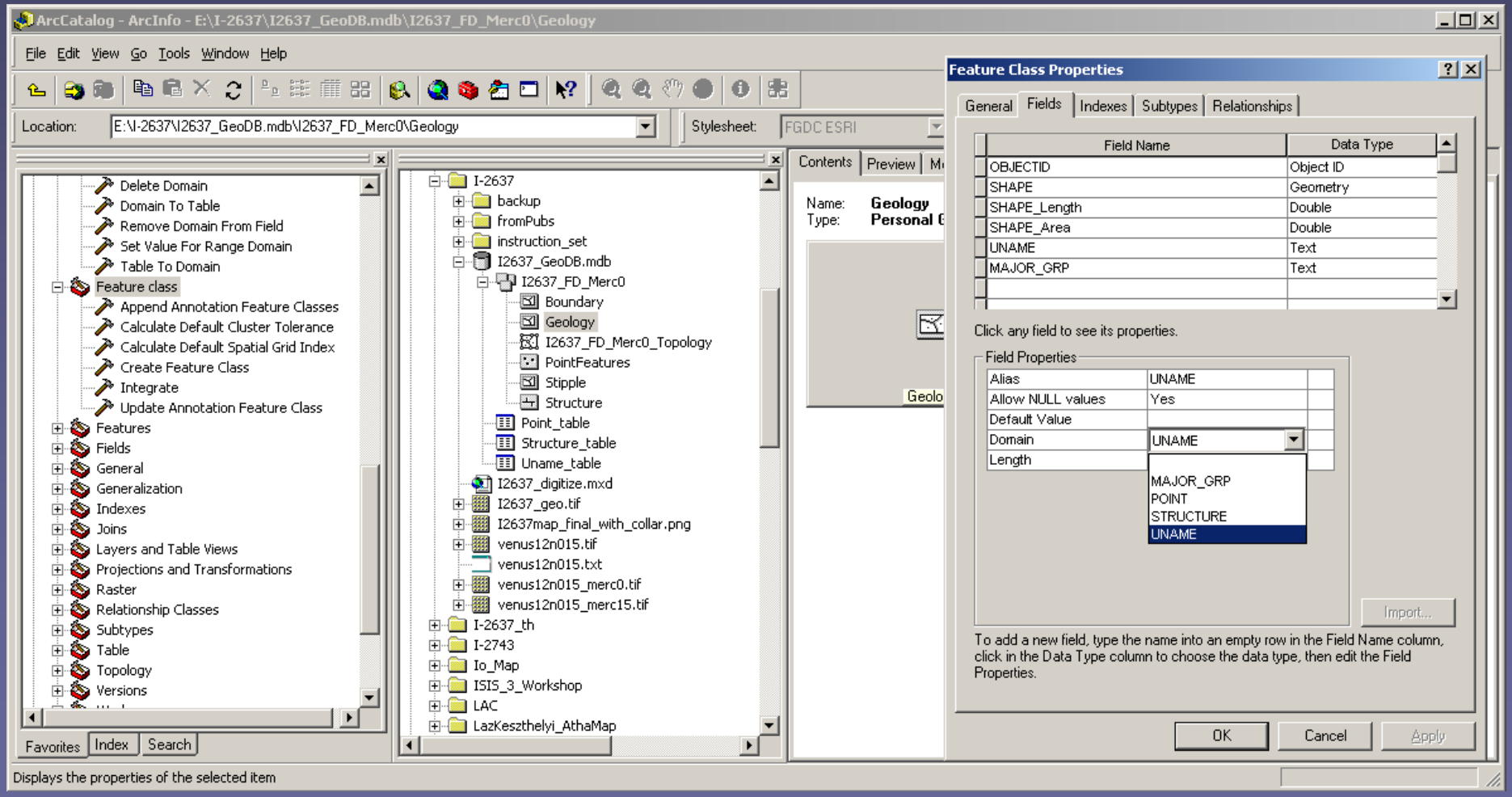


ArcCatalog

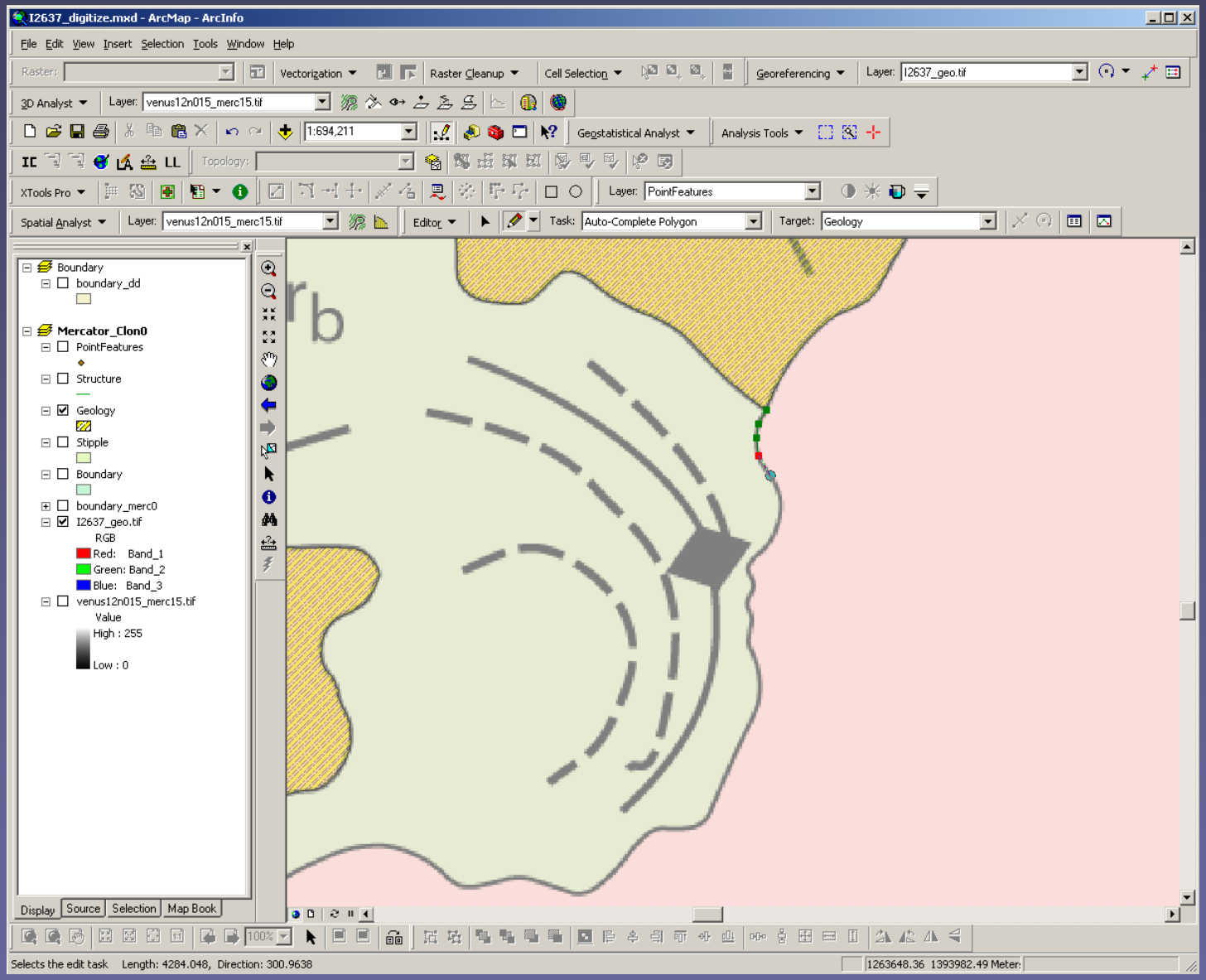
- Create Feature classes for Geology, Structure, and Point features.



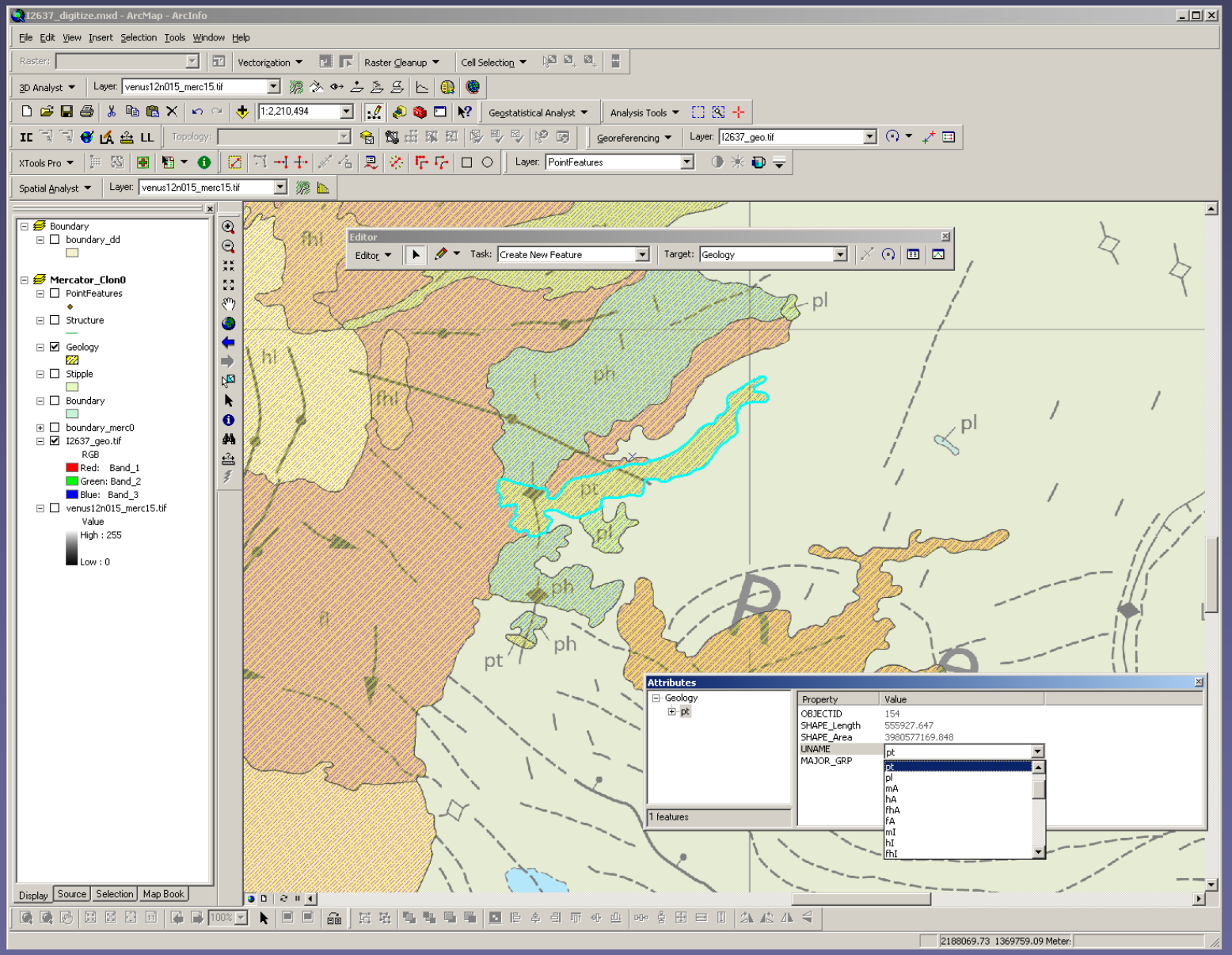
Add Fields to the Feature Classes, Assign Attribute Domains



ArcMap: Digitize Map



ArcMap: Attribute Features



Compare Mapped Geology to New Image Base